Installation and Operating Instructions for the

DT1000, DT2000, & DT8000

Pinewood Derby Finish Line and Timer

Software Version 4.0 (DT8000)
Software Version 2.0 (DT1000 & DT2000)

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NewBold Products, Atlanta GA
www.newboldproducts.com

1. Introduction

Thank you for purchasing the **DTX000**, Pinewood Derby Timer. Whether you're a Scout, Royal Ambassador, Awana, or in another group, we hope you find the **DTX000** helpful in developing your cars and conducting your race events. This manual refers to the "Pinewood Derby" (PWD) race event. We realize that many groups have different names for the event, but for simplicity we will use what seems to be the predominant name. This manual provides information for three models: DT1000, DT2000, and DT8000. Features specific to a particular model are noted in the sections that follow.

NewBold Products began designing and building PWD timers in 1996, initially a simple one-lane timer, primarily for developing fast cars. That first timer became a marketed product, the DT1000. The **DT8000** was our second PWD timer and represents a dramatic increase in product capability and performance while maintaining the same affordability that became our trademark with the DT1000. NewBold Products believes that high quality and low cost is possible through using a standard configuration regardless of the application.

Your **DTX000** timer will fit any track from 1 to 8 lanes regardless of length or lane spacing and can be used on tracks of **different groups** without any modification. To accomplish this, the **DTX000** automatically determines the track configuration and adjusts to provide the maximum information possible. A serial port connection interfaces to virtually any PC and **does not require any custom software**! The **DTX000** is a software-driven device, making the basic system flexible and inexpensive. While control and display functions are software based, all critical timing operations are performed in hardware to ensure precision.

FEATURES

- Timing accuracy to resolution of 0.1 ms (.0001 sec)
- Maximum time of 9.9999 seconds
- 8 Digit Liquid Crystal Display (LCD)
- Provides elapsed time and finish order for 1 to 8 lanes (depending on model)
- Configurable for use on **ANY** track regardless of length or width
- PC Interface, connects to any PC serial port
- PC Interface can be used with virtually any PC and NO custom software is required
- PC can reset timer, by pressing space bar <SPACE> (PC sends 20h to DT8000)
- Single configuration regardless of number of lanes in use
- Automatically determines lanes in use and selects the correct operating mode
- Simple and easy to learn user interface

ABOUT THIS MANUAL

The **DTX000** User's Manual contains the information that you need to install and operate the system and to conduct your Pinewood Derby event. If you are reading this document on your computer, you can use the blue hyperlinks to jump between sections. You should read the entire manual to fully understand and properly use the **DTX000**. *At a minimum you should read sections 2, 3, and 4*.

Section 2 provides a functional description of the **DTX000** describing connections, LCD display, start switch, Personal Computer interface, and a description of each operational mode.

Section 3 provides installation information to guide you through installing the start switch, stop sensors and placing the **DTX000** handheld unit.

Section 4 describes how the user will use the **DTX000** for each mode and specifics on how the unit interfaces to a PC.

Section 5 is our "Large Screen Displays" section describing a number of very low cost ways to display both the Finish Order and Elapsed Times for large crowds at a Pinewood Derby event. You can use equipment you already have to create an impressive race-time display for the audience.

Section 6 describes a few of the more important specifications of the **DTX000** product family and is provided primarily for the more technical reader interested in product details.

Section 7 is our Troubleshooting section.

Section 8 describes, warranty, return policies and ways to contact us.

RECEIVING YOUR SHIPMENT

Your order was carefully packed and inspected prior to shipment. Along with this manual, your order should contain at a minimum:

DTX000 Handheld unit (DURACELL 9V battery installed)
Starting Switch & cable (40 foot length standard)
Stop Sensors & cables (10 foot length standard)
- 1 stop sensor shipped standard for DT1000
- 2 stop sensors shipped standard with DT2000
- 3 stop sensors shipped standard with DT8000

Five Cable Mounts & Cable Ties

Some orders may contain additional equipment such as Stop Sensors (for tracks with 4 or more lanes), PC Interface cable, AC adapter, Carrying Case and Race Management Software. Note that the PC Interface cable is a standard DB9 Male to DB9 Female cable with a "straight through" or 1:1 configuration, available from most computer and electronics stores. Race Management Software such as DerbyMaster and RaceVIEW™ is available to enhance the use of the **DTX000**'s PC interface. NewBold Products is a distributor for DerbyMaster software from Enterprising Ideas, while RaceVIEW is available for purchase from Wilson Associates (www.raceview.com).

2. Functional Description

Unit Display, Interfaces and Controls:

The **DTX000** system is comprised of the handheld unit, start switch, and stop sensor(s). The handheld unit has eight (8) areas of interest. These items are:

1) 8 Digit LCD – displays finish order and/or elapsed time depending upon mode.
2) Green LED – when on, indicates that the **DTX000** is timing a race.
3) Reset Button – used to clear Self-Test displays and to reset prior to a new race.
4) On/Off Switch – turns on power to **DTX000**.
5) Low Battery LED – Red LED above power switch turns on when battery is low. (Version 2 hardware and later)
6) AC adaptor connection -allows use of a 9V wall adaptor in place of 9V battery. (Version 2 hardware and later)
7) 18-pin Header – connections for start switch and stop sensors 1-8.
8) DB9 Female – connection for PC interface, mates with DB9 Male connector.

Turning on the DTX000, Self-Test and Selecting the Correct Operating Mode:

1. Turn the power on by moving the "Power" switch up.
2. The handheld unit now performs a Self-Test. It turns on all segments of the LCD and turns on the LED to allow the user a check of all the displays.

3. Once the Self-Test is complete, press the RESET button to clear the display and the LED. At this point, the **DTX000** automatically determines how many stop sensors are connected and which operating mode you will be using.

IMPORTANT NOTE: *A sensor is only "found" present for a given lane if adequate light is present on the sensor for that lane. The LCD will display the number of lanes found i.e. " 3 LANES". If no lanes are found, the LCD will display "- - - - - - - -". This indicates the error situation where no stop sensors are found present. If this error is displayed, the user should check the stop sensor connections and light sources. Make sure all sensors are plugged into the unit and make sure all lights are placed closely above the sensors. Then turn the power off and back on using the On/Off switch. Make sure the correct number of lanes is displayed before continuing.*

4. Once the number of lanes is found and is correct, the user should press RESET.
5. After pressing RESET a second time, the LCD displays on which lanes sensors were found. A dash is illuminated for each sensor found. For example if you have a 6 lane track and only 5 sensors are found the LCD might show the following " - - - - -" to indicate that sensors were found connected to inputs for lanes 1, 2, 3, 5, and 6. This allows the operator to quickly identify a problem connection. [DT2000 models have 2 lanes max, and DT1000 models use a single lane]
6. Press RESET again to enter timing mode.

   The **DTX000** will enter one of three timing modes, based on the number of lanes found present:

   Mode 1 -- 1 Lane is Present (DT1000, DT2000 & DT8000)
   Mode 2 -- 2 Lanes are Present (DT2000 & DT8000)
   Mode 3 -- 3 to 8 Lanes are Present (DT8000 only)

   When the **DTX000** enters timing mode, the LCD will be blank and the LED will be off.

Mode 1: (DT1000, DT2000, and DT8000 models)

In Mode 1, the **DTX000** times a single lane. This mode can be used for car development prior to race events and for conducting single-lane time trials.

For this mode to work, the stop sensor must be connected to sensor input #1 and all other sensor inputs should be left open. After turning the power on, the user should press RESET to clear the Self-test display. After this RESET, the LCD will display " 1 LANE" to indicate that the stop sensor was found on for Lane #1. After pressing RESET again, the **DTX000** will display a single dash over the "1st" designation. Press RESET again to enter the timing mode.

The timing starts when the start switch moves and will stop when the car passes over the stop sensor. The LCD will then display the elapsed time with a resolution of 0.1 ms. Press RESET on the **DTX000** box or the space bar <SPACE> on your PC to clear the LCD and begin a new race.

An example time display on the LCD is:

2.5135

Using the Optional Computer Interface: (DT1000, DT2000 & DT8000)

This time is also transmitted by the **DTX000** serial port connected to an RS-232 port on a Personal Computer (PC). The time is sent to the PC using 7-bit ASCII characters that can be interpreted by any terminal type program such as the "Hyper Terminal" program, part of the Windows 3.1/95/98 Operating System. Refer to Section 4 for details on configuring your PC for communicating with the **DTX000**.

The data sent from the **DTX000** to the PC is similar to the following: (DT8000 shown)

```
DT8000   NewBold Products

2.5315
3.1022
   :
2.9673   ← Most recent time
```

Mode 2: (DT2000 & DT8000 models)

The **DTX000** times two lanes when in Mode 2.

The **DTX000** automatically enters this mode when stop sensors are found connected to sensor inputs #1 and 2 and all other sensor inputs are left open.

After turning the power on, the user should press RESET to clear the Self-test display. After this RESET, the LCD will display "2 LANES" to indicate that two stop sensors were found. After pressing RESET again, the LCD will display two dashes in the "1st " and "2nd" locations. After pressing RESET again, the **DTX000** will enter the timing mode.

Timing starts when the start switch moves and continues until both cars have crossed the finish line (passing over the stop sensors).

The LCD will first display the winning car's lane number and the elapsed time for that car. For the first place car, the lane number will be shown in the far left digit directly above the label that reads "1st".

For example if the car in lane 2 finishes first, the LCD display might read

```
2        2.5135
```

After displaying the winning lane # and elapsed time, the user should press RESET or <SPACE> to display the 2nd place lane number and elapsed time. The second place lane number is displayed on the LCD in the second digit of the display, directly above the label that reads "2nd". Pressing RESET or <SPACE> again will clear the LCD and the timer will be ready to time the next race.

Using a Computer to Display Finish Order and Times:

If you would like to display and perhaps save the race results, you can see this information by using the **DTX000** serial port. It will display the finish order and elapsed times for both cars.

The data sent by the serial port is formatted as 7-bit ASCII characters that can be interpreted by any terminal type program such as Windows 95's "Hyper Terminal". Refer to Section 4 of this manual for details on configuring your PC for communicating with the **DTX000**.

The data sent from the **DTX000** to the PC will be similar to the following where the data is provided as 1st Place Lane, 1st Place Time, 2nd Place Lane, 2nd Place Time. Each new race that is run will have a new set of times incrementally displayed on the computer screen. The times displayed on the bottom row are the most recent results. (DT2000 shown)

```
DT2000   NewBold Products

1 2.5455   2 2.9831
1 2.6790   2 3.1288
      :
2 2.8820   1 3.5109
```

Mode 3: (DT8000 only)

Mode 3 is for installations where 3 or more lanes are to be used, up to a maximum of 8. The **DT8000** automatically enters this mode when stop sensors are connected to 3 or more sensor inputs. All unused sensor inputs should be left open. After turning the power on, the user should press RESET to clear the Self-test display. After this RESET, the LCD will display "X LANES" to indicate that stop sensors were found on X Lanes, where X=3 to 8. After pressing RESET again, the LCD will display a dash in the location where each sensor was found. After pressing RESET again, the **DT8000** will enter the timing mode.

Timing starts when the start switch moves and continues until all cars have crossed the finish line (passing over the stop sensors) or the elapsed time is > 9.9999 seconds. Once the last car has finished, the LCD will display the finishing order for all cars. The LCD data is formatted to display from left to right: 1st Place Lane, 2nd Place Lane, etc. For example if 4 cars are racing and lane 3 finishes first followed by 4, 1, and 2, then the LCD will read " 3 4 1 2 ". Pressing RESET or <SPACE> will clear the LCD and the timer will be ready to time the next race. The DT8000 serial port transmits the finish order and elapsed times for all cars. The data sent by the serial port is formatted as 7-bit ASCII characters that can be interpreted by any terminal type program such as Windows 95's "Hyper Terminal". Refer to Section 4 for details on configuring your PC for communicating with the **DT8000**. The data sent from the **DT8000** to the PC will be similar to the following, where the data is provided as 1st Place Lane, 1st Place Time, 2nd Place Lane, 2nd Place Time etc. The following illustrates the data that might be received if four lanes are in use.

DT8000 NewBold Products

1 2.5455 2 2.9831 3 3.7745 4 3.8224
1 2.6790 3 3.1288 2 3.2092 4 3.5644
:
3 2.8820 1 3.5109 4 3.5134 2 3.6202

3. Installation Procedure

Tools Required To Install:
Before you get started with your installation, you will need to gather a few hand tools and related items required to test and operate the **DTX000**. The required items are:

1) Hand-held Drill & 3/8 inch drill bit
2) Wire cutters or scissors
3) Light source (typically 1, ***60-75W Incandescent Bulb*** for every 3-4 stop sensors)
4) Fine Tipped Punch or Nail (optional)

The DTX000 timer, start switch, and stop sensors are used on the pinewood derby racetrack as shown in Figure 1. The incandescent light doesn't need to be placed too close to the track, probably 3-6 feet above the track is sufficient depending on ambient light conditions.

Installing the 9V Battery
To install the 9V battery you will need to remove the back cover from the handheld unit. Remove the six machine screws that hold the two halves together. Remove the back cover and install the 9V battery into the black battery holder near the bottom of the circuit card. Replace the cover and install the six machine screws.

Using the 9V Wall Adapter
The wall adaptor that NewBold Product sells is a 2.1mm plug, 9VDC output adapter with the center conductor having the Positive polarity. **Warning: Using a wall adapter with the incorrect polarity will damage your timer making it inoperable.**

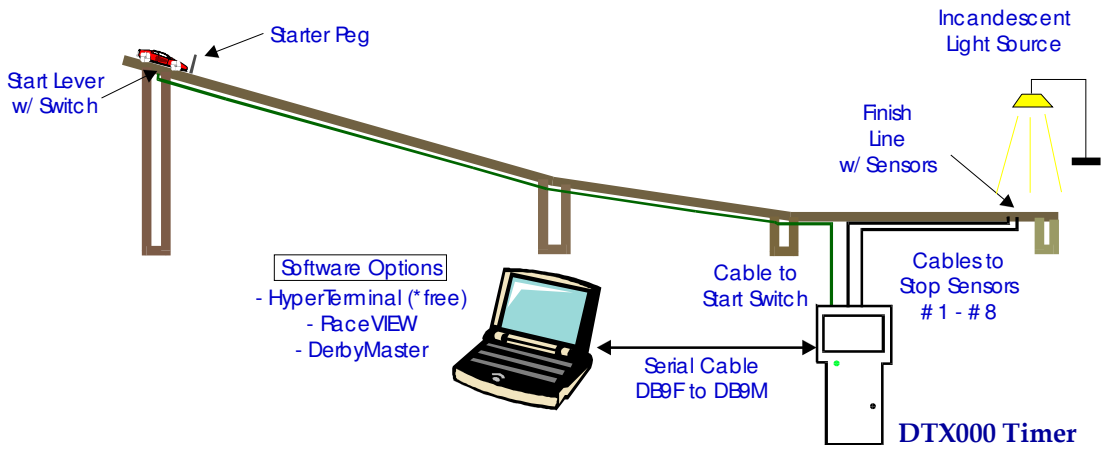

Figure 1. Timer, Switch, and Sensors

Installing the Stop Sensor(s) *(see Figure 2)*

To begin your installation, decide where you will place the stop sensor(s). They should be located at your track's finish line normally 32 feet from the starting line and also as close to the centerline of each lane as possible. Note that not all tracks are 32 feet in length, but 32 feet is probably the most common. Regardless of length, it is important that each sensor be equal distance from the starting line to avoid errors in timing and finish order.

Important: The stop sensor has a polarity, therefore it will only operate when connected in one way. Connect the sensor to the handheld unit so that the STRIPED wire or COPPER color wire is on the TOP wire (the wire closest to the front of the timer should have the stripe)

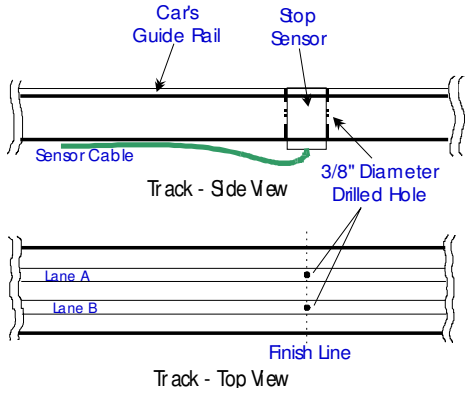

Figure 2 – Sensor Installation

The sensor diameter is 0.38". Once you have measured and marked the locations for the stop sensors, use a fine tipped punch or nail to make a starting indention. This will help keep the drill bit well centered when you begin to drill. You should consider using a smaller drill-bit to make a "pilot" hole. This pilot hole will keep the larger drill bit more precisely on your center mark.

If this is going to be a permanent installation you can glue each sensor in place using epoxy, a hot glue gun or other suitable glue. If you plan to use the **DTX000** on multiple tracks you probably want to make the sensor installation more temporary, using a weak glue or tape. Also you may not need any glue at all if your sensors fit snugly into your drilled holes.

Cable ties and cable holders are provided with your timer. You can position the cable holders on the bottom or sides of your track and use the adhesive back to attach them. The cable ties can then be used to bundle your wires together for a neater installation.

The stop sensors are provided with 10-foot wire lengths, so the **DTX000** handheld unit should be located about 5-6 feet up from your finish line and several feet away from the track.

Installing the Start Switch *(see Figure 3)*
Typically the starter's lever is implemented in a variety of ways. The start switch can be mounted to the side of the track with screws, epoxy, hot glue etc. The exact implementation is dependent on your particular track design. The start switch needs to be installed so that the **switch opens** when the starting lever of your track moves to start the race. Also be sure to move the lever quickly so that cars are not leaning on the Starting Peg as it moves forward. If you impede the car's progress with the Starting Peg, the elapsed times can vary from race to race, dependent on the speed at which the lever is moved. The start switch is supplied with a 40-foot cable length.

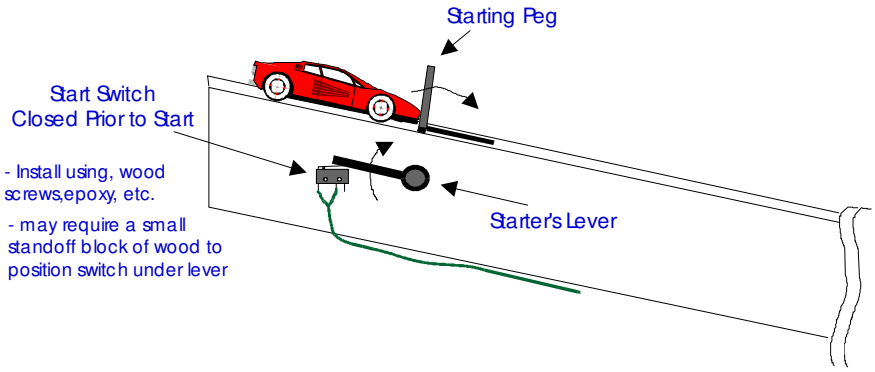
Starting Peg
Start Switch
Closed Prior to Start
- Install using, wood screws,epoxy, etc.
- may require a small standoff block of wood to position switch under lever
Starter's Lever

Figure 3 – Start Switch Installation

Routing Cables
You can route your cables however you think is best. We suggest using the supplied cable ties and cable mounts to attach the cables to the bottom of your track and routing them to the **DTX000** display in a bundle if possible.

4. Operation

General
As mentioned in Section 2, at power-up the **DTX000** will turn-on the LED and all segments of the 8-digit LCD. The user should press the "RESET" button to clear this initial state. The **DTX000** then determines the number of stop sensors connected to the handheld unit. Once the software makes this determination an operational mode is set. Once set, this mode cannot be changed except by powering down, removing or connecting additional sensors and reapplying the **DTX000**'s power.

If you plan to use the PC interface, you should configure the PC's terminal program and connect the **DTX000** to the PC prior to applying power to the **DTX000**. There is no problem with making this connection after power-up, but your PC will miss the initial information sent from the **DTX000**. Refer to the end of this section for information on how to configure your terminal program.

Mode 1 Operation (DT1000, DT2000 & DT8000)
In Mode 1, the LED will turn on once the Start Switch moves and turns off when the car crosses the finish line. After the car finishes the **DTX000**'s LCD will display the elapsed time and the PC if connected will also display the elapsed time. The LCD will hold this time indefinitely until the user presses the "RESET" button. After the user presses "RESET" the **DTX000** will clear the LCD and wait for the Start Switch to move. This cycle repeats continuously.

Mode 2 Operation (DT2000 & DT8000)

In Mode 2, the LED will turn on once the Start Switch moves and turns off after both cars cross the finish line for lanes 1 and 2. After both cars have finished, the **DTX000**'s LCD will display the winning car's lane number and the elapsed time for that lane. After the user presses "RESET" the LCD will display the second place car's lane number and elapsed time. The PC if connected will display the finish order and elapsed times for both lanes. The LCD will hold with this information indefinitely until the user presses the "RESET" button. After the user presses "RESET" a second time, the **DTX000** will clear the LCD and wait for the Start Switch to move. This cycle repeats continuously.

Mode 3 Operation (DT8000 only)

In Mode 3, the LED will turn on once the Start Switch moves and turns off after all cars have crossed the finish line. In this mode, the number of lanes in use can be any number from 3 to 8 and the stop sensors can be connected to any position at the 18 pin header. For example the user can have 4 lanes connected to **DTX000** connections for lanes 3, 4, and 6, and 8. The **DTX000** will wait for these four lanes to finish. **Important:** Only connect stop sensors for those lanes in use. Having additional sensors connected will cause the **DTX000** to wait for the additional lane to finish as well (or timeout after 9.9999 seconds)

After all cars have finished, the **DT8000**'s LCD will display the finishing order by lane number. The PC if connected will display the finish order and elapsed times for all lanes. The LCD will hold with this information indefinitely until the user presses the "RESET" button. After the user presses "RESET" the **DT8000** will clear the LCD and wait for the Start Switch to move. This cycle repeats continuously.

Configuring Your PC's Terminal Program (DT1000, DT2000 & DT8000)

The **DTX000** sends data to your PC at 1200 baud, with 7 data bits, no parity, and 2 stop bits. You should also turn flow control "OFF".

If you are using the Windows 95 operating system on your computer you likely have the terminal program "Hyper Terminal". This program can be found under <Start>, <Programs>, <Accessories>, <Hyper Terminal>. Once you have started this program, go to <File>, <New Connection>. The program will prompt you for a name, you could call the session "**DTX000**" or whatever you prefer. After giving a name, you will have a phone number dialog box. From this dialog box edit the "Connect Using" box to say "Direct to Comx". Where Comx is Com1, Com2, etc. The serial port for many PCs will be Com1, but this varies. After entering your Com port and <OK>, you will see a Comx Properties dialog box. At this box enter the connection properties as Bits per second = 1200, Data bits = 7, Parity = none, Stop bits = 2, Flow control = none. Once you have setup your session you can save it as "**DTX000**" or another name and each time you use the **DTX000** you can startup Hyper Terminal and simply load this file. If you are using another communications program such as ProComm you can make a similar setup file, only the steps will vary slightly.

Note on Font sizes: When using the Hyper Terminal program (or others) you can change the font size as required. For the best results (especially for large group displays as in Section 5) you may want to adjust your font so that your results for a single race fill the majority of the screen's width. This works particularly well for setups with less than 5 lanes.

5. Large Group Displays

NewBold Products has designed the **DTX000** to be as affordable as possible and yet provide maximum performance and flexibility. Yet for some Pinewood Derby events the race results need to be displayed so that large groups can all view the information in "real time". This real time

feedback adds excitement to the entire event. Because each group will have unique requirements, NewBold Products has included in this section a number of display alternatives.

During the late 90's, the consumer electronics industry has made large screen TVs, large computer monitors, and camcorders affordable to nearly everyone. It is the intention of this section to make the best use of these existing technologies to enhance your race event. Perhaps one of the most important benefits of using consumer electronics for your display is that most of these solutions can be implemented at **zero cost to your group!**

These solutions are presented for information only and they do not have to be implemented exactly as described here. In fact we expect that these ideas will only be a starting point for your group. Let us know how you implement your display and we'll provide this information in future manuals.

> *Disclaimer: NewBold Products does not formally endorse any of the following products, manufacturers or distributors expressly, but we are suggesting a few possible products as a starting point. These products are available from reputable dealers and manufacturers and have their own respective warranties etc.*

VGA to NTSC Converter

NTSC is the standard video format that TVs use in North America. Converters are widely available which convert your PC's VGA signal to an NTSC signal that can then be displayed on any TV. Several VGA to NTSC converters are mentioned in the following paragraph. By sending your VGA signal through a converter and to a big screen TV, such as a 27" or larger you can provide a very large real-time display system for your race. You could also split the NTSC signal and run two TVs, one on each side of your track or one at the starting line, one at the finish line.
Total cost: < $100 (using loaned or rented TVs)

Potential Solutions: **Note:** All of these converters allow you to run your VGA monitor and one or more televisions simultaneously. They also all require your television to have either a video or S-video input (most newer television have both). Refer to your television's documentation to confirm that it has this type of video input available.

PCConnection, 1-800-800-0009, www.pcconnection.com

1) Part #: 28607, Mfg: Focus Enhancements Inc., Model: Tview Micro, Cost: $89.95, Features: VGA In, Composite (RCA) or S-Video out, also VGA out, NTSC, 640 x 480, 24-bit color.
2) Part #: 49057, Mfg: Focus Enhancements Inc., Model: Tview Silver, Cost: $139.95, Features: Similar to Tview Micro except for 800 x 600 resolution.
3) Part #: 46511, Mfg: Avermedia Inc., Cost: $139.95, Features: VGA In, Composite or S-Video out also VGA Out, 1024 x 768 resolution.

Jameco Electronics, 1-800-831-4242, www.jameco.com

1) Part #: 105208, Mfg: Avermedia Inc., Cost $89.95, Features: VGA In, NTSC or PAL out also VGA out, 640 x 480 resolution.
2) Part #: 150447, Mfg: Maruda, Cost: $89.95, Features: VGA In, NTSC or PAL output, 640 x 480 resolution.

Laptop with NTSC Output

A number of laptops (several made by Compaq) come standard with a video output intended to drive the video input of a Television or video monitor. The laptop's video output can be used to drive a large Television, perhaps 27" or larger. If you have a member of your group with this type of laptop you may be able to implement your large screen display for little or no cost.

Large Computer Monitor

Many computer users are using fairly large monitors, such as 17", 19", or even 21". These monitors may be large enough for some applications to serve as your large group display.

LCD Projector (borrow from local company or rent) Very LARGE Display

Some members of your group may be able to borrow an LCD Projector from work for your race event. These LCD Projectors take a VGA or SVGA monitor signal and project it onto a wall or screen. These projectors have the advantage of making a very large display, useful for extremely large groups. They may also be available as a rental item from your local computer store. *This is becoming perhaps the most popular way to display race results.*

6. Specifications

Power Consumption

The Handheld unit operates from a 9V battery or AC adaptor. Typical alkaline batteries provide about 580 mAh of current to 4.8V, at which point the battery should be replaced. The current required by the **DTX000** varies depending upon how many stop sensors are connected. The current requirements and approximate battery life assuming an alkaline battery are provided below:

# of Lanes	Current (mA)	Battery Life (Hrs)
1	24.6	22
2	27.2	19.8
3	29.8	18.1
4	32.4	16.6
5	35.0	15.4
6	37.6	14.4
7	40.2	13.4
8	42.8	12.6

10.24 MHz Crystal Oscillator

The **DTX000** uses a 10.24 MHz Crystal Oscillator to run the microcontroller and the timing hardware that measures your car's elapsed time. The frequency stability of this oscillator is +/- 100 ppm. For a measured time of 2.5 seconds, the actual or "true" time may be 2.5 +/- 0.00025 seconds. However, the frequency stability is specified over a –10 to +70 C temperature range. Since the **DTX000** normally operates over a confined temperature range of 15 to 30 C, the working frequency stability is much better, +/- 20 ppm. This translates to a measurement error of +/- 0.00005. This is very good since it is one half of the **DTX000**'s time resolution.

7. Troubleshooting

7.1 Cars are not stopping timer. Recommendations: Check the lighting. Adjust the lighting away from the timer, so that the sensors are not found when timer is switched on. Then move the lighting closer to the track in 6 or 12" increments; continue turning the timer on and pressing reset to see if all lanes are recognized. Stop moving the light closer once all lanes are found. Minimize unnecessary ambient lighting if this seems to be a problem. Flash photography is not a problem with the DTX000.

7.2 Stop sensors are not found. Recommendations: verify that enough light is present over the sensor (60W for every 3-4 lanes), also make sure you are using an incandescent type of light. Verify that the sensors are plugged into the handheld unit with the correct polarity – copper facing up.

7.3 Timing or start/stop seem erratic. Recommendation: If you have very low times such as 0.2000 seconds, this indicates your light source is too low. Move the light source 3-6 inches closer to the stop sensors and retest. Test using 1 or 2 lanes only, to verify the elapsed time without using a computer.

7.4 Timer does not appear to stop. Recommendation: You may have too much light over the sensor. Back the light off some and try again. See section 7.1 for how to adjust the lighting.

7.5 Serial interface not sending data to computer. Recommendations:

1) Verify that the cable is well connected to both the timer and PC
2) Confirm that the cable is a "straight through" or 1:1 cable (this means that pin 2 connects to pin 2, pin 3 to pin 3 etc.)
3) Make sure that the serial port is configured properly if using Hyperterminal or Procomm
4) Verify that the connector you are using on your PC is really the Comm port you think it is. to test this: disconnect the PC interface cable at the DTX000 end, short pins 2 and 3 together and using Hyperterminal, type information on the keyboard, this info should be echoed back to your PC's monitor if you have selected the correct Comm port
5) Verify that your PC is not running any background applications that may be interfering with the Comm port, such as Palm Desktop applications. Under Win 95/98 the right side of the task bar shows programs that are resident in memory, some of these may need to be closed to allow your PC to talk to the Comm port.

7.6 DerbyMaster Problems: Please refer to in-program help documentation found when running DerbyMaster or contact Enterprising Ideas at 1 (972) 394-0381 or on the web at www.derbymaster.com.

7.7 RaceVIEW Problems: Please refer to the in-program help documentation found when running RaceVIEW or contact RaceVIEW at 1 (860) 514-4017 or on the web at www.raceview.com.

7.8 Grand Prix Race Manager Problems: Please refer to the in-program help documentation found when running Grand Prix Race Manager or contact Lisano Enterprises at 1 (303) 362-1300 or on the web at www.grandprix-software-central.com/gprm/

8. Contacting NewBold Products, Warranty and Return Policies

We would very much like to HEAR from YOU regarding the **DTX000** and how you used it for your car preparations and race event. Thanks for your input!

Send us email: feedback@newboldproducts.com
Call us: 1(866) NEW-BOLD or (678) 352-0084 Fax: (678) 352-1444
Mail: NewBold Products, 1200 Oakhaven Drive, Roswell, GA 30075

6- Year Parts & Labor Warranty

NewBold Products provides a six-year warranty for all equipment, starting from date of purchase and covering parts and labor. If you believe your equipment needs warranty repair contact us to let us know the nature of the problem and so that we can resolve it over the phone if possible. If the problem cannot be corrected over the phone we will request the equipment be returned to us for repair. The customer is responsible for shipping the product back to NewBold Products. NewBold Products will repair and return the equipment via Priority Mail or FedEx Ground. Faster shipping is available at actual cost. Warranty repairs are not applicable for modified or damaged equipment.

90 Day Return Policy

If for any reason, you are not satisfied with your equipment purchase, you may return it within 90 days of purchase for a full refund (excluding shipping charges). Once equipment is received and inspected we will issue a refund. This return policy does not apply to any modified or damaged equipment.